

WHAT IS CLAIMED IS

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1. A method of forming a metal film from a metal carbonyl compound source, comprising the steps of:

(A) introducing a gaseous source material containing a metal carbonyl compound into a process space adjacent to a surface of a substrate to be processed in such a manner that said metal carbonyl compound has a first partial pressure;

(B) depositing a metal film on said surface of said substrate by introducing a gaseous source material containing said metal carbonyl compound into said process space in such a manner that said metal carbonyl compound has a second, smaller partial pressure,

said step (A) being conducted such that there is caused no substantial deposition of said metal film on said substrate.

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2. A method as claimed in claim 1, wherein said step (A) is conducted by setting the temperature of a source vessel holding said metal carbonyl compound to a first temperature, and wherein said step (B) is conducted by setting the temperature of a source vessel holding said metal carbonyl compound to a second, lower temperature.

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3. A method as claimed in claim 1, wherein  
said step (A) is conducted by setting a flow rate of  
a carrier gas to a first value when supplying said  
gaseous source material containing said metal  
5 carbonyl compound to said process space and wherein  
said step (B) is conducted by setting said flow rate  
of said carrier gas to a second, larger value.

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4. A method as claimed in claim 1, wherein  
said step (A) is conducted by supplying said gaseous  
source material containing said metal carbonyl  
15 compound into said process space while setting a  
pressure of said process space to a first pressure,  
and wherein said step (B) is conducted by supplying  
said gaseous source material containing said metal  
carbonyl compound into said process space while  
20 setting a pressure of said process space to a second,  
lower pressure.

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5. A method as claim 4, wherein said first  
pressure is about 70Pa or less.

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6. A method as claimed in claim 4, wherein  
said second pressure is about 13Pa or less.

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7. A method as claimed in claim 1, wherein  
said step (A) and said step (B) are conducted at a  
substrate temperature of less than 500°C.

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8. A method as claimed in claim 1, wherein  
said step (A) and said step (B) are conducted at a  
10 substrate temperature of less than 400°C.

15 9. A method as claimed in claim 1, wherein  
a surface of said substrate is covered with an  
insulation film.

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10. A method as claimed in claim 1, wherein  
said metal carbonyl compound is selected from the  
group consisting of W(CO)<sub>6</sub>, Co(CO)<sub>6</sub>, Mo(CO)<sub>6</sub> and  
25 [Rh(CO)<sub>4</sub>].

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11. A method as claimed in claim 1, wherein  
said steps (A) and (B) are conducted continuously in  
a common processing vessel.